



VALIDATION REPORT

BIOGAS CDM PROJECT OF BAGEPALLI COOLIE SANGHA IN INDIA

REPORT No. 2008-1048

REVISION No. 02



VALIDATION REPORT

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CERTIFICATION AS

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Client: Bagepalli Coolie Sangha (BCS)	Client ref.: Mr. Venkatanarasappa

Project Name: Biogas CDM Project of Bagepalli Coolie Sangha
Country: India
Methodology: AMS-I.E & AMS-I.C
Version: 01 & 13 respectively
GHG reducing Measure/Technology: Biogas based thermal energy generation
ER estimate: 42 855 tonnes of CO₂ per year
Size
 Large Scale
 Small Scale
Validation Phases:
 Desk Review
 Follow up interviews
 Resolution of outstanding issues
Validation Status
 Corrective Actions Requested
 Clarifications Requested
 Full Approval and submission for registration
 Rejected

In summary, it is DNV's opinion that the "*Biogas CDM Project of Bagepalli Coolie Sangha*" in India, as described in the PDD version 6 dated 27 August 2009, meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology AMS-I.E version 01 and AMS-I.C version 13. DNV thus requests the registration of the project as a CDM project

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Report title: " <i>Biogas CDM Project of Bagepalli Coolie Sangha</i> " in India"		
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Key words:

Climate change
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VALIDATION REPORT

Abbreviations

BCS	Bagepalli Coolie Sangha
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH ₄	Methane
CL	Clarification request
CO ₂	Carbon dioxide
CO _{2e}	Carbon dioxide equivalent
CSU	Coolie sangha unit
DNV	Det Norske Veritas
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LPG	Liquified Petroleum Gas
MP	Monitoring Plan
MoEF	Ministry of Environment & Forests
MNES	Ministry of Non-Conventional Energy Sources
N ₂ O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change



VALIDATION REPORT

TABLE OF CONTENTS

1	EXECUTIVE SUMMARY – VALIDATION OPINION	1
2	INTRODUCTION	2
2.1	Objective	2
2.2	Scope	2
3	METHODOLOGY	3
3.1	Desk Review of the Project Design Documentation	3
3.2	Follow-up Interviews with Project Stakeholders	5
3.3	Resolution of Outstanding Issues	5
3.4	Internal Quality Control	8
3.5	Validation Team	8
4	VALIDATION FINDINGS	9
4.1	Participation Requirements	9
4.2	Project Design	9
4.3	Baseline Determination	10
4.4	Additionality	13
4.5	Monitoring Plan	15
4.6	Estimate of GHG Emissions	16
4.7	Environmental Impacts	16
4.8	Comments by Local Stakeholders	16
4.9	Comments by Parties, Stakeholders and NGOs	16

Appendix A: Validation Protocol

Appendix B: Certificates of Competence



VALIDATION REPORT

1 EXECUTIVE SUMMARY – VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the “Biogas CDM Project of Bagepalli Coolie Sangha” in India. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host Party criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The host Party India fulfils all the participation criteria and has approved the project and authorized the project participants. The DNA of India has confirmed that the project assists in achieving sustainable development /2/.

The project correctly applies the approved small scale methodologies, AMS-I.E version 01 “Switch from Non – renewable biomass for the thermal applications by the user” and AMS-I.C version 13 “Thermal energy for with or without electricity”.

By using biogas units, the project displaces the use of non renewable biomass fire wood and fossil fuel kerosene as a fuel for cooking and heating purpose, thereby resulting in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It has been demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

Adequate training and monitoring procedures have been defined in the project design document. The adequate implementation of same will be verified during the verification.

The total emission reductions from the project are estimated to be on the average 42 855 t CO₂/year over the selected 7 year renewable crediting period. The emission reduction forecast has been checked, and it is deemed likely that the stated amount will be achieved given that the underlying assumptions do not change.

In summary, it is DNV’s opinion that the “Biogas CDM Project of Bagepalli Coolie Sangha” in India”, as described in the PDD version 6 dated 27 August 2009, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodologies AMS-I.E, version 01 and AMS-I.C version 13. DNV thus requests the registration of the project as a CDM project activity.



VALIDATION REPORT

2 INTRODUCTION

Bagepalli Coolie Sangha has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the “*Biogas CDM Project of Bagepalli Coolie Sangha*” in India. This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, the simplified modalities and procedures for small-scale CDM project activities and the subsequent decisions by the CDM Executive Board.

2.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, the simplified modalities and procedures for small-scale CDM project activities and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodologies AMS-I.E and AMS-I.C.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.



VALIDATION REPORT

3 METHODOLOGY

The validation consisted of the following three phases:

- I a desk review of the project design documents
- II follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.

3.1 Desk Review of the Project Design Documentation

The following table lists the documentation that was reviewed during the validation:

- /1/ Bagepalli Coolie Sangha, PDD for “Biogas CDM Project of Bagepalli Coolie Sangha”
 - ,Version 01, dated 10 April 2008
 - Version 02, dated 29 September 2008
 - Version 03, dated 21 October 2008
 - Version 04, dated 28 November 2008
 - Version 05, dated 12 February 2009
 - Version 06, dated 27 August 2009
- /2/ Letter of approval from DNA of India dated 29 December 2008
- /3/ CDM Executive Board, *Clean development mechanism Validation and Verification Manual (Version 01)*.
- /4/ CDM Executive Board, Switch from Non – renewable biomass for the thermal applications by the user - AMS-IE - version 01, EB 37
- /5/ CDM Executive Board, Thermal energy for the user with or without electricity - AMS I C - Version 13 – EB 38
- /6/ Development of Sectoral CDM Project: A Case Study for Small Scale Biogas Project – http://www.snm.nl/pdf/0500_2.1_development_of_sectoral_cdm_project_background_paper.pdf
- /7/ Ramachandra, T.V., Vamshee Krishna S and Shruthi, B.V. - 2005. Decision support system for regional domestic energy planning. *Journal of Scientific and Industrial Research*. Vol 64, pp 163-174.
- /8/ T.V. Ramachandra and G.R. Rao - 2005. Inventorying, Mapping and Monitoring of Bio-resources using GIS and Remote Sensing. In: *Geospatial Technology for Developmental Planning*. Eds. SM Ramasamy, CJ Kumanan, K. Palanivel and Bhoop Singh. pp 49-76.
- /9/ FSI, 2008. State of Forest Report 2005. Forest Survey of India, Ministry of Environment and Forests, Government of India, Dehradun.
- /10/ FSI, 1989. Report on wood consumption study in Kolar District, Karnataka. Forest Survey of India, Southern Zone, Bangalore, Ministry of Environment and Forests, Department of Environment, Forests and Wildlife. Government of India
- /11/ Dabrase, P.S and Ramachandra, T.V. (2000). Integrated Renewable Energy System - Perspectives and Issues. Millennium International Conference on Renewable Energy



VALIDATION REPORT

- Technologies, IIT, Chennai.
- /12/ Annual Report, 2006-07. Ministry of New and Renewable Energy. Government of India. http://mnes.nic.in/annualreport/2006_2007_English/HTML/ch4_pg1.htm
- /13/ Shubhashis Gangopadhyay, Bharat Ramaswami, and Wilima Wadhwa. 2005. Reducing subsidies on household fuels in India
- /14/ Ministry of Non-Conventional Energy Sources, Government of India, <http://mnes.nic.in/booklets/Book1-e.pdf>
- /15/ Annual Reports, Rural Development & Panchayat Raj Department, Government of Karnataka, 2003 to 2008
- /16/ Evaluation Study On National Project on Biogas Development, Programme Evaluation Organisation Planning Commission, Government of India, New Delhi, 2002
- /17/ Usha Rao, K and Ravindanath, N.H.2002. Policies to overcome barriers to the spread of bioenergy technologies in India. Energy for Sustainable Development 1 Volume VI No. 31 September 2002
- /18/ Environmental Impact Assessment (EIA) notification of the Ministry of Environment and Forest, Government of India, 2006 - <http://envfor.nic.in/>
- /19/ Loan rejection letters from
 - Pragathi gramin bank, Gudibanda – 03 June 2008
 - Canara Bank , Bagepalli – 05 June 2008
 - Canara bank, Chintamani – 07 June 2008
- /20/ Board resolution letter for CDM consideration dated – 03 March 2008.
- /21/ Soft copy of the Emission Reduction calculations sheet.
 Soft copy of Baseline calculations sheet.
- /22/ [IPCC default values 2006 - http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol5.html](http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol5.html)
- /23/ ➤ Soft copy of List of 18000 families and villages.
 ➤ Soft copies of List of registered project activity villages (Velcan energy and Adats).
- /24/ CDM Executive Board, Guidelines for CDM consideration, EB 41 annex 46
- /25/ Copies of Stake holders meeting conducted in different villages – April 2008
- /26/ Copy of News paper announcement for inviting comments from the stake holders
- /27/ NSSO 2007. Energy Sources of Indian Households for Cooking and Lighting, 2004-05 National Sample Survey Organisation Ministry of Statistics and Programme Implementation Government of India, 2007.
- /28/ Housing Profile. Karnataka State. Census of India, Government of India. 2001.
- /29/ <http://www.pera.org/English/ogcf/auditesco.htm>
- /30/ Soft copy of Bagepalli Coolie Sangha: *Fuel wood and Kerosene data survey*
- /31/ Shaikh et al., Barriers to dissemination of renewable energy technologies for cooking. Centre for Energy Studies, Indian Institute of Technology, Delhi, Hauz Khas, New Delhi 110 016, India.
- /32/ N. H. Ravindranath and D. O. Hall. 1995. Biomass, Energy, and Environment: A Developing Country Perspective from India, Oxford University Press.
- /33/ Biogas Technology – New age International (P) Limited, Publishers – B.T Nijaguna 2002



VALIDATION REPORT

- /34/ <http://www.solutionexchange-un.net.in/environment/cr-public/cr-se-wes-18070601-public.pdf>
- /35/ <http://www.techno-preneur.net/technology/New-technologies/Energy/biogas.htm>
- /36/ http://chikballapur.nic.in/district_profile.html.
- /37/ Ministry of Environment and Forests, Government of India. Forest Survey of India 1996: *Demand and supply of fuel wood, timber and fodder in India.*

Main changes between the version of the PDD published for the 30 days stakeholder commenting period and the final version of the PDD submitted for registration:

- Changes related to the responses provided to the CARs and CLs identified in the DNV's draft validation report.
- The ER calculations have been changed with proper supporting documents.
- The investment analysis is replaced by investment barrier and other barriers.

3.2 Follow-up Interviews with Project Stakeholders

On 27 June 2008, DNV conducted a site visit to Bagepalli taluk of Chikkaballapur district approximately 200 households, selected at random, were visited and interviews were conducted to resolve the issues identified during the desk review. The site visit was conducted by NIKESH R S from DNV Bangalore. Representatives of M/s Bagepalli Coolie Sangha, M/s ADATS and M/s Velcan Energy were interviewed.

	Date	Name	Organization	Topic
/37/	2008- 06-27	Mr. Venkatanarasappa	M/s Bagepalli Coolie Sangha	<ul style="list-style-type: none"> ➤ CDM consideration ➤ Start date of Project ➤ Site visit for baseline (kerosene and fuel wood consumption) ➤ Baseline calculations ➤ Resources, training, procedures. ➤ Interaction with stakeholders and families involved in the project activity
		Mr.Ram Estaves	M/s ADATS	
		Dr. Sudha	M/s Velcan	
		Padmanabha	Energy	

3.3 Resolution of Outstanding Issues

The objective of this phase of the validation was to resolve any outstanding issues which needed be clarified prior to DNV's positive conclusion on the project design. In order to ensure transparency a validation protocol was customised for the project. The protocol shows in a transparent manner the criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet;



VALIDATION REPORT

- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for the “*Biogas CDM Project of Bagepalli coolie sangha*” is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of CDM criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

- i) mistakes have been made with a direct influence on project results;
- ii) CDM and/or methodology specific requirements have not been met; or
- iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.

The project has undergone a minor clarifications request, addressing issues related to the nationally approved survey method selected for the proposed project activity as per the requirement of the methodology. Upon the minor clarification request, the PDD and the validation report have been updated to incorporate the survey method practiced by Ministry of Environment and Forest. This final validation report is based on revised project design document; version 06 dated 27 August 2009.



VALIDATION REPORT

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities		
Requirement	Reference	Conclusion
<i>The requirements the project must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>This is either acceptable based on evidence provided (OK), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed.</i>

Validation Protocol Table 2: Requirement checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
<i>The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.</i>	<i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.</i>	<i>This is either acceptable based on evidence provided (OK), or a corrective action request (CAR) due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.</i>

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
<i>If the conclusions from the draft Validation are either a CAR or a CL, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the CAR or CL is explained.</i>	<i>The responses given by the project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i>

Figure 1 Validation protocol tables



VALIDATION REPORT

3.4 Internal Quality Control

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the project activity. The technical reviews were performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3.5 Validation Team

<i>Role/Qualification</i>	<i>Last Name</i>	<i>First Name</i>	<i>Country</i>	<i>Type of involvement</i>					
				Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	Expert input
CDM validator / technical team leader	Ramachandran	Ramesh	India				✓		
GHG auditor (S) / Project Manager	Ravandur Satish	Nikesh	India	✓	✓	✓			
Technical reviewers (applicant)	Kakaraparthi	Venkata Raman	India					✓	
Technical reviewers	Kumaraswamy	Chandrashe kara	India					✓	

The qualification of each individual validation team member is detailed in Appendix B to this report.



VALIDATION REPORT

4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation of 27 August 2009.

4.1 Participation Requirements

The project is being developed as a unilateral project by the project proponent Bagepalli Coolie Sangha (BCS) from the host Party India. The host Party India meets all relevant participation requirements. The DNA of India has approved the project on 29 December 2008 /2/.

The DNA of India has provided confirmation that the project assists in achieving sustainable development /2/. The validation did not reveal any information indicating that the project can be seen as a diversion of official development assistance (ODA) funding towards India.

4.2 Project Design

The project activity involves the installation of 18 000 bio digesters of 2 m³ capacity each, in the five taluks (Bagepalli, Chintamani, Sidlaghatta, Gudibanda and Chickballapur) of Chickballapur district in the state of Karnataka, India. Five taluks of former Kolar district have been separately named as Chickballapur district on 23 August 2007 /36/. As the statistics have been compiled for the formerly Kolar district, discussions and study in the report address Kolar district. The bio digesters are planned in stages of 6 000 units per year, with the first 6000 units being planned after the registration of the project as a CDM project. The project activity envisages replacement of kerosene and non-renewable biomass with biogas for cooking and hot water heating.

The biogas digester equipment consists of a digester of 2 m³ capacity with a fixed, non-movable gas space. Gas is produced through anaerobic digestion of cow dung and stored in the upper part of the digester before being piped to the biogas stove in the kitchen. The gas pressure displaces the digested slurry into the compensating tank, which then can be used as manure. The technology used in the project activity is indigenously available in India and is based on the Deenbandhu digester model approved by the Ministry of Non Conventional Energy Sources (MNES).

The operation and maintenance of the plants will be taken up by Bagepalli Coolie Sangha (BCS). BCS maintains a network of trained masons and supervisors who will train individual household members and also assist in maintaining close contact with the households to attend to the operational and maintenance problems.

Since the project activity will be implemented only on the registration of the project as a CDM project, the project activity does not have a start date which would correspond to the definition of start date of “implementation or construction or real action of the project activity” as provided by the Executive Board. The expected start date is 1 May 2009 or the



VALIDATION REPORT

date of registration of the project. The expected operational lifetime of the project activity is 25 years. A renewable crediting period of seven years has been chosen with the starting date of the first crediting period as 01 Jan 2010. The project description is to the consideration of DNV complete and accurate.

4.3 Baseline Determination

The baseline for the project activity is the continued usage of fuel wood and kerosene oil for household cooking and heat purpose. The project activity will thus replace non-renewable biomass as well as kerosene. For the displacement of non-renewable biomass, the project applies the approved baseline methodology AMS-I.E - version 01 "Switch from Non – renewable biomass for the thermal applications by the user" /4/, while for the displacement of kerosene AMS-I.C - version 13 "Thermal energy for the user with or without electricity" /5/ is applied.

The application of the simplified baseline methodology of I.E "Switch from Non – renewable biomass for the thermal applications by the user" is justified as the project activity satisfies the following applicability conditions of

- a) the project activity is a biogas digester and stove that displaces non renewable wood used in the baseline.
- b) The project activity is not saving non renewable biomass accounted-for by another similar CDM project, i.e. the "Bagepalli biogas project" The villages selected for the proposed CDM project activity are different from the registered CDM project, as verified and cross checked from the list provided by the PP to differentiate villages selected to install the biogas units/23/.
- c) It is demonstrated by the "Report on wood consumption study in Kolar district", Forest Survey of India, southern zone 1989 document that the non renewable biomass was in use since 31 December 1989. The survey report states that the consumption of timber is 37 000 m³ /year. The report also addresses that there is a wide gap between the demand and supply in Kolar district. The fire wood availability is 31208.4 tonnes / annum which is the average from last 3 financial years (1984/1985, 1985/1986 and 1986/1987) /10/.

The application of the simplified baseline methodology of I.C "Thermal energy for the user with or without electricity" is justified as the project activity satisfies the following applicability conditions.

- a) The thermal capacity of the biogas plant is not specified by the manufacturer. However, the PP has computed the total thermal generation of all the 18 000 biogas plants (operating 4 hours per day) considered in the project activity to be 33 MW thermal which is well below the limit specified in the methodology (45 MW thermal). Also, this has been justified clearly in the PDD with references for the calculations.
- b) The proposed project activity is installation of biogas units at individual households and will not fall under co fired system and co-generation plant.
- c) The proposed project activity is not addition of renewable energy units in an existing renewable energy facility.

The baseline for the project activity as per the methodology AMS-I.E is the non-renewable biomass consumption per household that would have been used in the absence of the project



VALIDATION REPORT

activity times an emission coefficient for the fossil fuel displaced /4/. The baseline emissions have been calculated using the option a) provided in the methodology that is “calculated as the product of the number of appliances multiplied by the estimate of average annual consumption of biomass per appliance (tonnes/year), derived from the historical data or estimated using survey methods”

The baseline for the project activity as per the methodology AMS-I.C is the fuel consumption per household that would have been used in the absence of the project activity times an emission coefficient for the fossil fuel displaced /5/.

DNV verified from the information provided in the department of science and technology, Government of India website /35/ that the capacity of the proposed 2 m³ biogas digester suffices the requirements of individual families of four to five members.

The quantity of firewood used per family in the baseline has been arrived at by a survey conducted by the project proponent on a sample of 835 households in the five taluks of the districts /30/. The quantity of fuel wood consumption per household arrived at is 3.57 t/year/household. The fraction of non renewable biomass in the total quantity has been arrived at by the project proponent at 91%. A similar study conducted by T.V.Ramachandra and G R Rao in the year 2005 for the specific project area of Kolar District /8/ and available on the public domain indicates the yearly consumption of fuel wood at 3.0733 t/house hold/year, and the fraction of non renewable biomass at 80%. The area specific Kolar District study done by Ramachandra and Rao has been used in order to establish the share of fuel wood currently used that can be considered non-renewable. The study comprised the use of fuel wood and fuel wood availability of 11 Taluks in the Kolar district. The study determines a ratio of available fuel wood resources vs. fuel wood demand for each Taluk in the Kolar district. It concludes that on average this ratio is 0.2, thus indicating that fuel wood demand significantly exceeds available fuel wood resources in Kolar district. This average ration of available fuel wood resources vs. fuel wood demand is used by the project to conclude that only 20% of the fuel wood is renewable, while the remaining 80% of the fuel wood used in the Kolar district is considered non-renewable. The use of the study by Ramachandra and Rao for defining the share of non-renewable fuel wood is considered appropriate, in particular since the target households considered for application of the biogas digesters in the project activity are located in the same 11 taluks as the study is based on. Since the major portion of emission reductions in the project activity are from the fire wood consumption, to be on the conservative side, the lower figures of fuel wood consumption at 3.0733 t/house hold/year /7/ and the fraction of non renewable biomass at 80% has been used in the estimation of the baseline CO₂ emission per household/annum /8/. All the documents and figures have been evidenced by DNV.

Approach adopted nationally by the Ministry of Environment and Forests, Government of India.

- The extent of production and demand of fuel wood was assessed by the Forest Survey of India, Ministry of Environment and Forests, Government of India. The study is entitled “*Demand and supply of fuel wood, timber and fodder in India*” *Forest Survey of India, Ministry of Environment and Forests, Government of India, 1996*”/37/



VALIDATION REPORT

- This study is based on growing stock of the country and its annual increment to determine the annual availability of fuel wood for different forest types. The percentage production of fuel wood is considered as 30% of the annual increment. This is compared to the total fuel wood required at the state level by the rural and urban population for the year 1996, 2001 and 2006.
- According to the study, in Karnataka State, the total annual consumption of fuel wood during 2006 is 13 million tonnes of which only 1.33 million tonnes are sustainably available. Thus at the state level, the renewable fuel wood available accounts to 10%. Thus the non-renewable wood is 90%.
- A study was conducted by Forest Survey of India, Ministry of Environment and Forests during 1987 to assess the wood consumption in Kolar district¹. Based on the study, the fuel wood requirement in 1987 was 800 000 tonnes/annum against the production of 31 000 tonnes. Thus the $f_{NRB,y}$ in 1987 was 96%.

Based on the above comparison of different studies conducted by Project proponent, Ramachandra and forestry survey of India, DNV concludes that the 80-90% of the biomass is non-renewable. The value of 80% chosen by the project proponent is deemed conservative and has been evaluated using nationally approved methods.

The quantity of kerosene used by each household has been sourced from the survey study of Ramachandra for firewood and kerosene consumption in the Kolar district. The studies indicate a kerosene consumption of 60.92 litres/family/yr /7/. The one time survey conducted by the project proponent (for 835 house holds) indicates a figure of 45 litre/family/year /30/. However, since the survey of the project proponent was one time and did not cover the full year, it is not representative in terms of seasonal consumptions. Hence, the consumption figure reported in the survey of Ramachandra /7/ at 60.92 litres/family/yr has been used in the estimation of the baseline CO₂ emission per household/annum.

The quantities of fuel wood and kerosene consumption per household have been determined by the project based on survey of firewood and kerosene consumption in the Kolar District. The fuel wood consumption per household has been determined based on the Ramachandra study carried out for the region/7/. The studies have showed an estimated average consumption of fuel wood for a medium size family of 5 people of 3.07 tonnes per year; a range from 2.29 to 3.68 tonnes per family per year with an average of 3.07 tonnes per family per year for Kolar District /7/. The quantity of biomass substituted by 18000 biogas units user will workout to be 55,319 tones per year. Considering 80% of the fraction of non renewable biomass/8/, the baseline emission due to firewood work out to be 47 191 tones CO₂ /year. The baseline emissions due to Kerosene usage considering 60.96 liters / family / year works out to be 2 807 tones CO₂ / year. The total emission reductions from fire wood and kerosene are 49 998 tones CO₂ / year. Based on the total emission reductions values the emissions per family have been worked out to be 2.78 tones per family per year. These values are

¹ FSI, 1989. Report on wood consumption study in Kolar District, Karnataka. Forest Survey of India, Southern Zone, Bangalore, Ministry of Environment and Forests, Department of Environment, Forests and Wildlife. Government of India



VALIDATION REPORT

considered appropriate and are correctly applied in the presented emission reduction calculations. The selected sources and gases are justified for the project activity.

4.4 Additionality

The project activity will only start after registration of the project. The source of funds for the implementation of the project is by the forward trading of the emission reductions and hence the project implementation has not yet started. In addition, it has been demonstrated that CDM has been seriously considered for some time for the project activity from the following sequence of events.

- a) Board minutes of meeting dated 03 March 2008 of Bagepalli Coolie Sangha (BCS) /20/ informing the members of the decision to develop the project activity of 18 000 bio-digesters as a CDM project.
- b) .The ERPA and the forward trading details have not yet been finalized pending the registration of the project as a CDM project.
- c) Intention of the project proponent to develop the project as a CDM project is clear by obtaining the letter of Approval from the DNA of host Party India /2/.
- d) Start of validation of the project on 22 April 2008, through the web hosting of the PDD for global stakeholder commenting process.

The above events clearly demonstrate that the CDM revenues are decisive for the project activity. The additionality of the project has been established based on the investment barrier, barrier due to prevailing practice and other barriers. The project activity primarily demonstrates the additionality through the investment barrier.

Investment Barrier

It has been demonstrated that the project activity faces investment barrier in the sense that the single unit of bio digester including the stove costs INR 12 500 for the implementation when compared to the conventional kerosene stove which costs INR 300 or the conventional brick stove which costs nothing. The cost of implementation of a bio digester has been verified to be appropriate /34/. It has also been demonstrated that the kerosene fuel used in the project households is made available to the households at subsidized rates, in the fair price shops and that the cost in the open market is prohibitive and beyond the means of the target population /37/. While the use of LPG has also been considered, it has been argued that LPG availability is limited mainly to the cities and penetration in the remote target villages is yet to happen. While there is a slow shift towards LPG use in villages/7/, the costs of installing and operating a LPG facility is beyond the reach of this project's target population in the Kolar region of Karnataka /37/. The research study of Dabruse and Ramachandra verified by DNV also indicate that, the economic barrier is the dominant reason for not installing biogas plants /11/. The presented analysis thus demonstrates that the project activity (installation of 2 m3 biogas digesters) faces investment barriers.

It has also been demonstrated that due to the low income of the households in the project area, obtaining of individual loan for the implementation of bio digesters without any security/surety/collateral is difficult. DNV has verified the existence of this barrier from the banks loan rejection letters /19/.



VALIDATION REPORT

The fact that the project activity is planned to be implemented with the funds obtained from the forward trading of the emission reduction also demonstrate that funding for the project activity depends entirely on the CDM registration and that obtaining investment is an barrier.

Barrier due to prevailing practice

It has been established that the prevailing practice in the village households in the project area is the continued reliance on kerosene available at subsidized prices and non-renewable biomass firewood that is abundantly available and free of cost. It has been substantiated that in spite of the subsidies offered by the government on fossil fuels like kerosene and LPG, the predominant fuel is non renewable biomass/13/ due to the reasons that though the kerosene is subsidized, the quantity supplied (3 liters per month per family) is insufficient and the price of kerosene in the open market is higher and beyond the budget of the target households in the district. An important reason for this is that subsidized fuel is not always available to the poor. While the LPG is also subsidized, there is no/low penetration in to the interior villages, and even the subsidized prices are beyond the budget of the households. In rural India, biomass is more easily available and access to LPG is more difficult than in urban areas. Thus, the continued use is the use of kerosene and the use of non-renewable wood is the common prevailing practice /8/. This is also evidenced by the document Energy Sources of Indian Households for Cooking and Lighting, which states that at the national level 75% of the rural households and at state level of Karnataka 89% of the rural households still use fuel wood /27/.

The potential for biogas in India is 12 million. But only 3.71 million have been built so far /14/. At the state level, during the 2001 census, only 1.5% of rural households were using biogas/28/, while in 2006 it still remains a low of 6.5%/27/. The Central and State Government through subsidies has just supported about 3,500 biogas units, on an average of 700 biogas plants annually in Kolar District in the past 5 years/15/. DNV also verified from the Annual reports of Rural Development & Panchayat Raj Department 2003-2008 and references /14/16/17/ documents that the penetration of biogas technology from 2001 to 2006 has just increased by 5% /27/28/.

Other Barriers

While the conventional three rock stoves do not need any skill for building, the biogas digesters, on the other hand, requires careful designing and skill for assembly /31/32/. These are also not freely available in the market and the target villages, as compared to the baseline technology of three rock stove. However, DNV confirms that this is not a decisive barrier for the project activity.

The above barriers therefore make it unlikely that biogas plants in Kolar are build today in the absence of the CDM and the project is thus not a likely baseline scenario. Moreover, the analysis of investment, technological and prevailing practice barriers demonstrates that the continued use of conventional three rock stove and the continued use of fuel wood and kerosene is the most likely baseline scenario.



VALIDATION REPORT

4.5 Monitoring Plan

The monitoring plan is in accordance with the monitoring methodology. The monitoring plan will give opportunity for real measurements of achieved emission reductions. The monitoring indicators chosen are a) number of systems installed b) number of biogas units operating and c) annual hours of operation of each unit. Also, annual survey will be conducted to confirm the non-renewable biomass substituted. As per the methodology requirement for leakage data, the diversion of non – renewable biomass saved under the project by non-project households will be monitored in the 5 taluks based on annual sample survey.

While the project owner is Bagepalli Coolie Sangha (BCS), project implementation, operation and maintenance is the responsibility of each coolie sangha unit (CSU). The monitoring of the bio digesters will be done by the balakendra teacher / village health worker on a daily basis and the data logged in a log book. The organization has biogas masons and supervisors who will be responsible for plant construction, supervision and maintenance. Biogas field workers and volunteers will monitor the construction and operation of the units in each village. All complaints and maintenance needs shall also be dealt with by Bagepalli coolie sangha staff. Procedures for performance reviews, internal auditing, corrective actions etc have also been addressed and rest with Bagepalli coolie sangha. The application of the monitoring methodology is transparent and DNV considers the project participants able to implement the monitoring plan.

4.5.1 Parameters determined ex-ante

For determining the baseline emissions under small scale methodology I.E version 01, the values mentioned in the methodology for the NCV of biomass (0.015 TJ/t) and emission factor of kerosene (71.5 tCO₂/TJ) will be used.

To determine the baseline emission due to the displacement of the kerosene and non-renewable fire wood, the emission factor of 2.78 tonnes CO₂/house hold/annum has been derived assuming a yearly fuel wood consumption of 3.0733 t/house hold/year, a 80% non renewable component and 60.2 liters kerosene per year/family. The source of the data and the assumptions are detailed in the baseline determination section 4.3.

4.5.2 Parameters monitored ex-post

The following parameters will be monitored ex post,

- The number of units constructed,
- Number of biogas units under operation (daily monitoring of all biogas units operating),
- Confirmation that the non renewable biomass has been substituted by sample survey,
- Fraction of non renewable biomass substituted as per the annual survey,
- Non – usage of biogas units and annual hours of operation of each unit.
- Annual hours of operation of biogas units per day by sample survey
- The diversion of non renewable biomass saved under the project activity by non – project households for leakage will be monitored based on the survey.



VALIDATION REPORT

Since the emissions reduction per household are less than 5 tonnes of CO₂e per year, metering of thermal energy output is not required.

4.5.3 Management system and quality assurance

Detailed project management and monitoring procedures under village level and cluster level including procedures for QA/QC of monitoring reports are described and found to be adequate.

4.6 Estimate of GHG Emissions

The project is displacing non renewable biomass fuel wood and kerosene. In line with the approved methodologies of AMS-IE and AMS-IC, and upon consideration that 80% fuel wood and 60.2 liters / family /annum of kerosene used for cooking and water heating is non-renewable, baseline emissions are estimated at 2.78 t CO₂/year/household for each household that will be attached to one system (2 m³ capacity). In the first seven year renewable crediting period the project is expected to reduce emissions to the extent of 2 99 988 t CO₂.

There are no direct offsite and indirect emissions involved in this project. Since the proposed 2 m³ biogas digester suffices the requirements of individual families, no fuel wood or other fuels will have to be used in the project scenario. However, if the biogas unit is non functional or monitored data is not available, for that period it will be considered as the use of fire wood and the project emissions will be equal to baseline emissions. Also, leakage will be monitored as per the methodology IE based on the ex post survey.

The baseline emission estimate can be replicated using the data and parameter values provided in the PDD and supporting files submitted for registration. The data sources mentioned have been verified by DNV.

4.7 Environmental Impacts

As per the MoEF, there is no legislation requirement to be adhered-to by the proposed project activity /18/.The project is also not expected to create any adverse environmental or social effects.

4.8 Comments by Local Stakeholders

Key stakeholders involved in this project are the households in the villages and the gram panchayats (local government bodies). All the key stakeholders were invited for comments through a news paper announcement /26/. The CDM project was discussed in cluster level meeting in all the 5 taluks of the Chikkaballapur district. All households and village gram panchayats have welcomed the project and no adverse comments have been received /25/.

4.9 Comments by Parties, Stakeholders and NGOs

The PDD of the “Biogas CDM Project of Bagepalli coolie sangha” dated 10 April 2008 was made publicly available on DNV’s climate change website and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from “22 April 2008” to “23 May 2008”.



VALIDATION REPORT

No comments were received during this period.

APPENDIX A

CDM VALIDATION PROTOCO

Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion
About Parties		
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	OK
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	CAR 1 OK
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	Not Applicable
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	Not Applicable
About additionality		
10. Reduction in GHG emissions shall be additional to any that would occur in the	Kyoto Protocol Art. 12.5c,	OK

Requirement	Reference	Conclusion
absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	CDM Modalities and Procedures §43	
About forecast emission reductions and environmental impacts		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
For large-scale projects only		
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	Not Applicable
About small-scale project activities (if applicable)		
13. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 I of the Marrakech Accords and shall not be a debundled component of a larger project activity.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK
14. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and use the simplified baseline and monitoring methodology for that project category.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK
15. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK
About stakeholder involvement		
16. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	OK
17. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project	CDM Modalities and Procedures §40	OK

Requirement	Reference	Conclusion
design document and comments have been made publicly available.		
Other		
18. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
19. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	OK
20. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
21. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
22. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK

Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. General Description of Project Activity <i>The project design is assessed.</i>					
A.1. Project Boundaris <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1. Are the project's spatial boundaries (geographical) clearly defined?	/1/	DR I	The project activity is the installation of 18000 biogas plants (digesters) in 5 taluks of Chikkabellapur district of Karnataka state, India. <ul style="list-style-type: none"> ➤ The geographical co ordinates is not mentioned in the PDD, clarify ➤ Location map and identifying the state and district of the project activity to be included in the PDD. 	CL	OK
A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR I	Yes, The project's system boundaries are clearly identified. The project comprises of biogas digesters and stoves for burning the gas generated; 18000 digesters each of 2 m3 capacity have been envisaged per household in the proposed project.		OK
A.2. Participation Requirements <i>Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project</i>					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>Participant.</i>					
A.2.1. Which Parties and project participants are participating in the project?	/1/	DR I	India is the host country and Bagepalli Coolie Sangha is the only project participant from India. No Annex-1 country has been identified as yet.		OK
A.2.2. Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	/1/ /2/	DR	Host country letter of approval needs to be provided for verification.	CAR-1	OK
A.2.3. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority	/1/ /2/	DR	India fulfils the participation requirements, having ratified the Kyoto Protocol on the 26 August 2002 and has established a D-A - National Clean development Mechanism Authority, Ministry of Environment and Forests (MoEF). The voluntary participation of the project needs to be confirmed against the letter of approval from the DNA.	CAR-1	OK
A.2.4. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	/1/	DR I	The project does not involve any public funding and hence, no diversion of funds from official development assistance is expected.		OK
A.3. Technology to be employed <i>Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that</i>					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>environmentally safe and sound technology and know-how is used.</i>					
A.3.1. Does the project design engineering reflect current good practices?	/1/	DR I	The project biogas technology to be used is based on the Deenbandhu model, a model that is one of the approved models by MNES.		OK
A.3.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/	DR I	No transfer of technology is envisaged as the same is already available in India.		OK
A.3.3. Does the project make provisions for meeting training and maintenance needs?	/1/	DR	Yes, the project requires initial training and maintenance efforts. It is mentioned that, Sufficient training will be provided to the end users for maintenance.		OK
A.4. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i>					
A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development?	/1/ /2/	DR	The letter of approval from the DNA confirming that the project assists in achieving sustainable development needs to be submitted.	CL-1	OK
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	Yes, the project avoids the health hazards due to usage of fire wood as a fuel for cooking and create more jobs in the region.		OK
A.5. Small scale project activity <i>It is assessed whether the project qualifies as small-scale CDM project activity</i>					
A.5.1. Does the project qualify as a small scale CDM	/1/	DR	The project confirms to Type I, Category I.C	CL-2	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/4/ /5/ /6/ /33/	I	of the small scale CDM project activities as the thermal energy generated would be used up by the users (i.e., the village households). The calculations sheet to justify less than 45 MW thermal to be furnished with proof for assumptions.		
A.5.2. Is the small scale project activity not a debundled component of a larger project activity?	/1/	DR I	No the project is not a debundled component of a larger project activity, since there is no registered small scale CDM project or an application to register another small scale CDM project – with the same project participants, in the same project category or technology.		OK
B. Project Baseline <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
B.1. Baseline Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Does the project apply an approved methodology and the correct version thereof?	/1/	DR	Yes the project applies, two small scale methodologies- “Switch from non renewable biomass for the thermal application by the user”- I.E Version 01 EB 37 and “Thermal energy for users with or without electricity”- I C version 13 EB 38.		OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/1/ /4/	DR	The following applicability conditions of the AMS I-E Version1 methodology need more	CL3	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	/5/		substantiation: Use of non Renewable biomass since 1989. Whether there are any similar registered project in this region and how the proposed project activity is not saving the non renewable biomass accounted by the registered activity Proof for use of non – renewable biomass since 31 December 1989, survey reports to be furnished.		
B.2. Baseline Scenario Determination <i>The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.</i>					
B.2.1. What is the baseline scenario?	/1/ /4/ /5/	DR I	The baseline is the use of kerosene and fire wood as fuel. During the site visit it was noticed that, about 5% of 500 villages considered in the project activity were using the kerosene and wood as a fuel.		OK
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/ /4/ /5/	DR	No, this is not required as per the small scale methodology.		OK
B.2.3. Has the baseline scenario been determined according to the methodology?	/1/ /7/	DR I	The baseline is mentioned as use of fossil fuel for meeting the thermal energy needs. The PDD mentions the use of only kerosene in the projected baseline. It has to be clearly	CL4	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			justified as to why LPG is totally excluded.		
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /4/ /7/	DR	Clarifications pending as above. It has to be justified that the monitoring of 2.5% of the digester plants as mentioned in the PDD is representative as required by the methodology.	CL4 CL5	OK
B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /14/	DR I	Yes, There is a clear thrust under the Ministry of Non-Conventional Energy Sources (MNES) in India to promote bio gas plants.		OK
B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/ /	DR I	The references have to be mentioned clearly, when and who conducted the surveys mentioned in the PDD. In the excel sheet provided it is not clear that the survey was third party or the PP has conducted. All the surveys conducted by third party to be furnished in the form of report for verifications (Quantity of biomass that is substituted and family level kerosene consumption per year).	CL8	OK
B.2.7. Have the major risks to the baseline been identified?	/1/	DR	There are no major risks considered to the baseline in the PDD.		OK
B.3. Additionality Determination <i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i>					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.3.1. Is the project additionality assessed according to the methodology?	/1/	DR	<p><i>The project additionality is discussed based on the investment barrier as below:</i></p> <p>The DSCR is computed to be 2.42 in the PDD. However, all the assumptions and supporting documents to be furnished for validation. The investment analysis has to be inline with the latest EB guidelines.</p> <p>It is mentioned that, the PP approached the banks for funding the project activity. Since there is no guarantees, no equity etc... the banks are not willing to finance the project. During the site visit, the bank loan rejection letters from Canara bank, Chintamani taluk dated 07 June 2008 and Pragathi gramin bank, Bagepalli taluk dated 03 June 2008 were verified.</p> <p>The additionality arguments for investment barriers are generic and not backed up with appropriate documented references.</p> <p>The PDD claims “The project activity is financed almost completely through the revenues from the CER sales, and cannot be realized without the revenues from the carbon credits” – This needs to be verified since there is no documentary proof as regards to project funding.</p> <p>It is mentioned that, biogas is most expensive option but eliminates all NRB consumption and kerosene usage when compared to</p>	CL-6	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			baseline. Justify the calculations made in the PDD with supporting documents for assumptions.		
B.3.2. Are all assumptions stated in a transparent and conservative manner?	/1/	DR	Same as above	CL6	OK
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	Same as above	CL6	OK
B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	/1/	DR	No, the start date of the project is mentioned as 01 October 2008, original board note considering CDM dated 03 March 2008 was provided for validation during the site visit. The start date to be substantiated as per the EB guidelines. The CDM consideration documents to be provided for validation as per the guidelines on CDM consideration of EB 41 Confirmation from DNA or UNFCCC has to be provided.	CL7	OK
B.4. Calculation of GHG Emission Reductions – Project emissions <i>It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	There are no project emissions to be considered as per the methodology.		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.4.2. Have conservative assumptions been used when calculating the project emissions?	/1/	DR	Same as above.		OK
B.4.3. Are uncertainties in the project emission estimates properly addressed?	/1/	DR	Same as above.		OK
B.5. Calculation of GHG Emission Reductions – Baseline emissions <i>It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /7/ /8/ /30/	DR	<p>Yes, the calculations are clear and transparent as per the small scale methodology IE.</p> <p>The calculations are based on the survey report of Kerosene and fire wood used in the baseline. It was noted during the site visit that, 5% of the 500 villages considered in the project were using kerosene and fire wood as fuel.</p> <p>However, In the excel sheet provided it is not clear that the survey was third party or the PP has conducted. All the surveys conducted by third party to be furnished in the form of report for verifications (Quantity of biomass that is substituted and family level kerosene consumption per year). Also, provide the</p>	CL8	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			proof /references for all parameters used in the calculations.		
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	Same as above	CL8	OK
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	Same as above	CL8	OK
B.6. Calculation of GHG Emission Reductions – Leakage <i>It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /4/	DR	Yes, this is addressed as per the methodology AMS IE. Clarifications required on the, usage of the conventional fuels incase of non performance of biogas plant.	CL44	OK
B.6.2. Have conservative assumptions been used when calculating the leakage emissions?	/1/	DR	This will be monitored ex post by conducting survey method.		OK
B.6.3. Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	There are no uncertainties addressed in the PDD for leakage.		OK
B.7. Emission Reductions <i>The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.</i>					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/1/	DR	Yes, The project is forecasted to reduce CO2 emissions 42 855 tCO2e / year over the renewable crediting period of 7 years. The emission reductions are measurable, and give long-term benefits related to the mitigation of climate change comparing to baseline scenario		OK
B.8. Monitoring Methodology <i>It is assessed whether the project applies an appropriate monitoring methodology.</i>					
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Yes, this is as per the approved small scale methodology IE.		OK
B.8.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/	DR I	This is not addressed in the PDD. It is not clear in the PDD that, How the monitored data will be stored during or after the crediting period	CL9	OK
B.9. Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
B.9.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/ /4/ /5/	DR	There are no project emissions to be considered due to the project activity		OK
B.9.2. Are the choices of project GHG indicators reasonable and conservative?	/1/	DR	Not applicable		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.9.3. Is the measurement method clearly stated for each GHG value to be monitored and deemed appropriate?	/1/	DR	Not applicable		OK
B.9.4. Is the measurement equipment described and deemed appropriate?	/1/	DR	Not applicable		OK
B.9.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR	Not applicable		OK
B.9.6. Is the measurement <i>interval</i> identified and deemed appropriate?	/1/	DR	Not applicable		OK
B.9.7. Is the <i>registration, monitoring, measurement and reporting</i> procedure defined?	/1/	DR	Not applicable		OK
B.9.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR	Not applicable		OK
B.9.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	Not applicable		OK
B.10. Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.</i>					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/ /4/	DR	As required by the methodology ,the monitoring plan lacks details related to the following: Monitoring to confirm the displacement of non renewable biomass Details of how the quantity of renewable biomass will be monitored	CL10	OK
B.10.2. Are the choices of baseline GHG indicators reasonable and conservative?	/1/	DR	The choice of CO2 as GHG indicators is reasonable.		OK
B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/	DR	Clarifications pending as section B.10.1	CL10	OK
B.10.4. Is the measurement <i>equipment</i> described and deemed appropriate?	/1/	DR	There are no measuring equipments described in the project activity.		OK
B.10.5. Is the measurement <i>accuracy</i> addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR	. Clarifications pending as section B.10.1	CL10	OK
B.10.6. Is the measurement <i>interval</i> for baseline data identified and deemed appropriate?	/1/	DR	Clarifications pending as section B.10.1	CL10	OK
B.10.7. Is the registration, <i>monitoring, measurement</i> and <i>reporting</i> procedure defined?	/1/	DR	This is clearly addressed in the PDD. The volunteers, masons, staff and CDM coordinator are the responsible persons for the monitoring.		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.10.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR	Not applicable, There are no equipments used in the monitoring parameters, hence no calibration is required.		OK
B.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	This is clear in the PDD monitoring plan.		OK
B.11. Monitoring of Leakage					
<i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/ /4/	DR I	The PDD has addressed direct leakages from day to day handling, defective digesters, digester clean up and also indirect leakages resulting from use of this biomass as manure. Clarifications required on the, usage of the conventional fuels incase of non performance of biogas plant.	CL-11	OK
B.11.2. Are the choices of project leakage indicators reasonable and conservative?	/1/	DR	Clarification pending as above	CL-11	OK
B.11.3. Is the measurement method clearly stated for each leakage value to be monitored and deemed appropriate?	/1/	DR	Clarification pending as above	CL-11	OK
B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/	DR	No, according to the MoEF, no EIA is required for such kind of projects.		OK
B.12.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	This is not applicable for this type of project activity		OK
B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/	DR	This is not applicable for this type of project activity		OK
B.13. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
B.13.1. Is the authority and responsibility of overall project management clearly described?	/1/	DR	Yes, the authority and responsibility of overall project is clearly mentioned in the PDD. The volunteers, masons, staff and CDM coordinator are the responsible persons for the monitoring		OK
B.13.2. Are procedures identified for training of monitoring personnel?	/1/	DR	Yes, this is clearly addressed in the PDD. Sufficient training will be provided for maintenance and monitoring.		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	No adverse emergencies are foreseen. Emergencies can be related to problems in the reactor. These are addressed in PDD that any such problems will be responded within 24 hours and will be rectified within one week.		OK
B.13.4. Are procedures identified for review of reported results/data?	/1/	DR	Yes, this is clearly addressed in the PDD. The volunteers, masons, staff and CDM coordinator are the responsible persons for the monitoring		OK
B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	Yes, this is clearly addressed in the PDD.		OK
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1. Are the project's starting date and operational lifetime clearly defined and evidenced?	/1/	DR I	Yes, the start date of the project is mentioned as 01 October 2008 and the life time of the project is mentioned as 25 years. Proof for start date to be furnished.	CL-7	OK
C.1.2. Is the start of the crediting period clearly defined and reasonable?	/1/	DR	Yes, a renewable crediting period of seven years has been chosen with the starting date of the first crediting period as 01 Jan 2010.		OK
D. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
D.1. For Small-scale projects					
D.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity?	/1/ /18/	DR	According to the MoEF, EIA is not required for such kind of projects.		OK
D.1.2. Does the project comply with environmental legislation in the host country?	/1/ /18/	DR	There is no legislation and hence not applicable.		OK
D.1.3. Will the project create any adverse environmental effects?	/1/	DR	No, The project does not create any adverse Environmental or social effects.		OK
D.1.4. Have environmental impacts been identified and addressed in the PDD?	/1/	DR	Not applicable, see above comments.		OK
E. Stakeholder Comments					
<i>The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i>					
E.1.1. Have relevant stakeholders been consulted?	/1/ /25/ /26/	DR	Key Stakeholders have been the families involved, apart from Gram panchayats of the villages concerned. A survey of families has been conducted as part of the survey for kerosene and firewood consumptions. Considering the nature of the project, this is deemed adequate. However during the site visit, The copies of minutes of meeting from most of the village level stakeholders meeting were provided for verifications.		OK
E.1.2. Have appropriate media been used to invite	/1/	DR	Direct one to one consultations with the		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
comments by local stakeholders?	/25/ /26/		families involved in the project activity have been undertaken.		
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	No, It is not required by regulation/law.		OK
E.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR	No adverse comments have been received		OK
E.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR	No adverse comments have been received.		OK

Table 2b: Additional requirements checklist for VVM version 1 (EB 44)

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.6. Letter of approval					
A.1.1 Is the LoA received directly from the DNA or through the project participant.	/4/	DR	The Letter of approval has been received from the project proponent directly and was verified from the website http://cdmindia.nic.in/index.html .	CAR+	OK
A.7. Project design					
A.2.1 Does the PDD describe the CDM project activity with all relevant elements in a transparent and accurate way?	/1/ /23/	DR	Yes, The Project activity is installation of 18000 biogas units in the Bagepalli coolie sangha families of chikaballapur district, Karnataka.		OK
A.2.2 Has the CDM project activity at the start of the validation been constructed or does the CDM project activity use existing facilities or equipment?	/1/	DR	The CDM project activity is construction of new biogas units at target village families of BCS. The project activity does not use existing facilities or equipment.		OK
A.2.3 Is the project a large scale project, a small scale project with average annual emission reductions above 15 000 tonnes or a bundled small scale project? Has on-site visit been carried out?	/1/	DR I	The project activity is a small scale project activity with average annual emission reduction above 15000 tonnes. The estimated emission reductions being 42 855 tonnes of CO2 per year. DNV conducted the site visit on 27 June 2008.		OK
A.2.4 Does the project activity involved alteration of existing installations? If so, have the differences between pre-project and post-project activity been clearly described in the PDD?	/1/	DR	Not applicable, The project activity is a green field project activity.		OK
A.8. Project emissions not addressed by the methodology					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.3.1 Does the methodology describe all project emission source for the project activity that contributes all 1% of the emission reductions? Sources that the methodology considers not to take into account are not relevant (e.g. cement and iron consumption for building hydropower plants).	/2/	DR	The methodology does not specifically detail all the project emissions.		OK
A.9. Documentation of baseline emissions					
A.4.1 Documentation of the baseline determination: a. All assumptions and data used by the project participants are listed in the PDD and related document to be submitted for registration. The data are properly referenced. b. All documentation is relevant as well as correctly quoted and interpreted. c. Assumptions and data can be deemed reasonable d. Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD. e. The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity	/1/	DR	a. All the assumptions and references have been clearly mentioned in the PDD. b. All the documents are relevant and national and sectoral policies have been considered. e. The PDD is clear on as to what would have occurred in the absence of the project activity. Small scale methodology AMS I E is correctly applied for the project activity.		OK
A.10. Documentation of the calculations					
A.5.1 Algorithms and/or formulae used to determine emission reductions <ul style="list-style-type: none"> All assumptions and data used by the project participants are listed in the PDD and related document submitted for registration. The data are properly referenced All documentation is correctly quoted and interpreted. All values used can be deemed reasonable in the context 	/1/	DR	Refer section 4.3 Baseline determination section in the report		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
of the project activity <ul style="list-style-type: none"> The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the data provided in the PDD and supporting files to be submitted for registration. 					
A.11. Implementation of the monitoring plan					
A.6.1 How were the plans for implementation of the monitoring plan, data management, QA/QC procedures assessed? To what extent can the emission reductions achieved by the project be monitored ex-post and verified later by a DOE?	/1/	DR	Refer section 4.5 Monitoring section in the report		OK
A.12. CDM consideration prior to starting date					
A.7.1 The prior consideration of CDM for the project activity complies with EB41 annex 46	/20/ /24/	DR / I	Yes, The original board note of BCS was verified by DNV during site visit. The real action of the project activity will start only on the registration of the project as CDM project with UNFCCC.		OK

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CAR.1 Letter of approval from host country to be furnished for verification.	A.2.2 A.2.3 A.4.1	<i>HCA is furnished for validation</i>	The Host country letter of approval dated 29 December 2008 has been verified by DNV. CAR is closed
CL 1. <ul style="list-style-type: none"> ➤ The geographical co ordinates is not mentioned in the PDD, clarify ➤ Location Map and identifying the state and district of the project activity have not been provided. 	A.1.1	<ul style="list-style-type: none"> - The geographical coordinates of the taluks are mentioned in the revised PDD. - The map of the state, district and taluk has been provided in the revised PDD. 	The latitude and longitude of the 5 taluks (Bagepalli, Chikkaballapur, Chintamani, Gudibanda and Sidlaghatta) involved in the CDM project are mentioned in the revised PDD version 02. The location of the project activity with map is clearly mentioned in the section A.4.1.4 of the revised PDD version 02. CL is closed.
CL 2 Clarification is requested on the assumptions and supporting data to justify that the project activity is below 45MW thermal and hence is a small scale activity under methodology I C version 13.	A.5.1	<ul style="list-style-type: none"> - The assumption and supporting data has been provided in the revised PDD, which shows that the project activity is below 45 MW thermal and hence is a small scale project. - It is based on the following equation (Nijaguna, 20–2 - Biogas Technology) $E = \eta \cdot H_b \cdot V_b$	All the supporting documents for the calculations have been furnished and found acceptable. The total thermal capacity of 18000 biogas plants works out to be 33 MW thermal which is below 45 MW thermal to fit in as a small scale project as per AMS IC. This was verified from the Biogas technology book by B T Nijaguna and below website-

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			<p>http://www.snm.nl/pdf/0500_2.1_development_of_sectoral_cdm_project_background_paper.pdf CL is closed.</p>
<p>CL 3 The following applicability conditions of the AMS I-E Version1 methodology need more substantiation: Use of non Renewable biomass since 1989.</p> <p>Whether there are any similar registered project in this region and how the proposed project activity is not saving the non renewable biomass accounted by the registered activity.</p>	<p>B.1.2</p>	<ul style="list-style-type: none"> - the use of non-renewable biomass since 1989 has been shown in the revised PDD. This is based on the survey done by Forest Survey of India (FSI), Govt. of India, for Kolar district during 1987, which shows that since then non-renewable has been in use in the project area. - There is a CDM project “Bagepalli biogas CDM Project - 0121” implemented in the same taluks of the project activity. But the villages are entirely different from those of the registered CDM project. A list of villages in which the registered project is operational and that in which the project will be implemented is provided for your reference. 	<p>DNV verified from the Forest Survey of India report, Govt of India that non renewable biomass have been used in the Kolar district from 1987. This is addressed in the revised PDD version 02.</p> <p>During validation site visit, the villages were randomly selected and visited for proper check for biogas plant installation and baseline. It was verified by DNV that there were no biogas plants installed in the selected villages and they were all different from the registered CDM project villages. This was also verified from the list provided for the present project and the registered CDM project. DNV confirmed that, both the list of villages were different. CL is closed.</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>CL 4 The PDD mentions the use of only kerosene in the projected baseline. It has to be clearly justified as to why LPG is totally excluded.</p>	<p>B.2.3 B.2.4</p>	<p>The baseline selected is kerosene as next to biomass, it is the most dominant fuel used in the project area. LPG is not used much in the project area. This is justified by the third party study conducted by Ramachandra et al, 2005 - Reference No. 4 in the PDD.</p>	<p>DNV verified from the third party study conducted by Ramachandra et al, 2005 that the usage of the LPG is very minimum in the 5 taluks where the CDM project is considered. Also, the usage of LPG is not affordable by the poor families where the CDM project is considered. CL is closed</p>
<p>CL 5 It has to be justified that the monitoring of 2.5% of the digester plants as mentioned in the PDD is representative as required by the methodology.</p>	<p>B.2.5</p>	<p>This has been revised. There would be 100% monitoring of the biogas plants for its construction and operation through out the crediting period.</p>	<p>The PDD version 02 is corrected to monitor complete 18000 biogas plants involved in the project activity during the crediting period. CL is closed</p>
<p>CL 6 The DSCR is computed to be 2.42 in the PDD. However, all the assumptions and supporting documents to be furnished for validation. The investment analysis has to be inline with the latest EB guidelines.</p> <p>The additionality arguments for investment barriers are generic and not backed up with appropriate documented references. It is mentioned that, biogas is most expensive option but eliminates all NRB consumption</p>	<p>B.3.1 B.3.2 B.3.3</p>	<p>The additionality section has been revised. The DSCR, included earlier was deleted as it is not pertinent to this project activity. The project activity will be implemented only with the forward sale of CERs.</p> <p>The investment and other barriers have been elaborated in the revised PDD.</p>	<p>Based on the CL 6 raised, the PP has revised the investment analysis discussions due to lack of documents as per the EB 41 annex 45 guidelines. Hence, the additionality arguments were revised in the version 02 of the PDD.</p> <p>The additionality argument is revised from investment analysis to investment barrier, barrier due to prevailing practice and other barriers in revised</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>and kerosene usage compared to the baseline scenario. Justify how biogas is an expensive option with supporting documents.</p> <p>CL 6 Continued Clarification is requested on Supporting documents for the prevailing practice Technological barrier and other barrier.</p>		<p>Supporting documents have been furnished for prevailing practice and other barrier.</p>	<p>PDD.</p> <p>DNV confirmed from the documents provided that, prevailing practice in the project region is the Use of kerosene available at subsidized rate and fuel wood which is free of cost. Also, it was confirmed that the basic 3 rock stove does not require any skill compared to the biogas units which requires periodic maintenance and operational skills.</p> <p>CL is closed.</p>
<p>CL 7 The starting date has to be demonstrated with supporting documents.</p> <p>The CDM consideration documents to be provided for validation as per the guidelines on CDM consideration of EB 41.</p> <p>Confirmation from DNA or UNFCCC has to be provided.</p>	<p>B.3.4</p>	<p>- The project can be implemented only after the registration of the project and forward CER funding is provided to implement the project. The likely start date of construction of the biogas units have been taken as the start date of the project activity.</p> <p>- The PDD was web-hosted before the start date of the project activity.</p> <p>All the details of the project were provided to the DNA before the start date for Host Country Approval. The meeting for Host Country Approval was</p>	<p>The construction of the biogas plants will start post registration as CDM project. There is no proof available for start date as the project will be implemented only after registration.</p> <p>The board note dated 03March 2008 in original was verified by DNV and it is clearly mentioned that the project to be constructed under CDM benefits.</p> <p>The notification letter dated 14 July 2008 from the MOEF of India for meeting on CDM project was verified by DNV.</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		attended by the PP in July, before the start date of the project activity. A notification to attend the meeting is provided for reference.	CL is closed
<p>CL 8 In the excel sheet provided it is not clear that the survey was third party or the PP has conducted. All the surveys conducted by third party to be furnished in the form of report for verifications (Quantity of biomass that is substituted and family level kerosene consumption per year). Also, provide the proof /references for all parameters used in the calculations</p> <p>The FNRB is considered as 100 % in the ER calculations sheet, justify with supporting documents.</p>	<p>B.5.1 B.5.2 B.5.3</p>	<p>- The calculations have been revised based on the Third Party Survey for kerosene and biomass use. The revised calculations have been included in the revised PDD.</p> <p>- The calculation for the thermal capacity has been computed and included in Section B.2</p> <p>Fraction of non renewable biomass has been revised to 80% in the calculations.</p>	<p>Based on the CL 8, The Project proponent has revised the CER calculations with sufficient data for references and third party survey reports. DNV verified the survey reports, CER calculations and found acceptable. This has been addressed in the revised PDD.</p> <p>The assumption is revised to 22.1 MJ/m³ based on the Biogas technology,(B T Nijaguna, New age international publishers, 2002) in the revised PDD version 02.</p> <p>The PP has calculated NRB based on the data available for the project region and computed the FNRB to be 91%. However, for conservativeness the FNRB of 80 % is used in the calculations which was evidenced from “<i>Geospatial technology for developmental planning</i>”. Both the</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			FNRB values have been discussed and presented in the revised PDD. CL is closed.
<p>CL 9 It is not clear in the PDD that, How the monitored data will be stored during or after the crediting period.</p>	B.8.2	The monitored data will be stored during and 2 years after the crediting period electronically and on paper.	It is addressed that the monitored data will be archived for two years after the crediting period. CL is closed.
<p>CL 10 As required by the methodology, the monitoring plan lacks details related to the following: Monitoring to confirm the displacement of non renewable biomass and details of how the quantity of non renewable biomass will be monitored.</p>	B.10.1	- the displacement of non-renewable biomass is through annual stratified sample conducted in the project area.	The displacement of non renewable biomass will be monitored by survey method annually. This has been addressed for the leakage in the revised PDD. CL is closed.
<p>CL 11 Clarifications required on the usage of the conventional fuels incase of non performance of biogas plant.</p>	B.11.1 to 11.3	- Daily monitoring of the usage of biogas units will be done at the village level. The days biogas units are dysfunctional, will be treated as usage of conventional fuels and accordingly CERs will be reduced. The revised PDD has this clarification addressed.	It is mentioned in the revised PDD version 02 that, everyday all the biogas units will be monitored at village level and the days the biogas unit is not functional it will be considered as the usage of the conventional fuels. Based on the annual monitored values the CER will be deducted for that particular period. CL is closed.

APPENDIX B

CERTIFICATES OF COMPETENCE



CERTIFICATE OF COMPETENCE

Nikesh Ravandur Satish

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes				
Technical Area	CDM Validator	CDM Verifier	Sector Expert	Methodology Expert	Technical Reviewer
<i>Landfill gas</i>					
<i>Hydro power</i>	Jan 2009	Jan 2009			
<i>Renewables</i>					
<i>Wind power</i>					
<i>Other renewable</i>					
<i>Biomass</i>					
<i>Grid connection of isolated system</i>					
<i>Cement</i>					
<i>Waste-heat / waste-gas recovery</i>					
<i>Efficiency of thermal power plants</i>					
<i>Coal mine methane</i>					
<i>Fuel switch</i>					
<i>Manure management</i>					
<i>Waste / wastewater treatment</i>					
<i>Energy efficiency</i>					
<i>N₂O</i>					
<i>HFCs</i>					
<i>Flare reduction</i>					
<i>PFCs</i>					
<i>Charcoal</i>					
<i>CO₂ recovery</i>					
<i>Transport</i>					
<i>Non-renewable biomass</i>					
<i>Biofuel</i>					
<i>Pipeline leakage reduction</i>					
<i>SF₆</i>					

Høvik, 9 January 2009

Michael Lehmann

Michael Lehmann

Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Kumaraswamy Chandrashekara

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-9-8-i1-CDMJI-
i1

GHG Auditor:		yes			
Technical Area	CDM Validator	CDM Verifier	Sector Expert	Methodology Expert	Technical Reviewer
<i>Landfill gas</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Renewables</i>	<i>Hydro power</i>	Jan 2009			
	<i>Wind power</i>	Jan 2009		Jan 2009	Jan 2009
	<i>Other renewable</i>	Jan 2009			
<i>Biomass</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Grid connection of isolated system</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Cement</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Waste-heat / waste-gas recovery</i>	Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
<i>Efficiency of thermal power plants</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Coal mine methane</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Fuel switch</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Manure management</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Waste / wastewater treatment</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Energy efficiency</i>	Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
<i>N₂O</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>HFCs</i>	Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
<i>Flare reduction</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>PFCs</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Charcoal</i>	Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
<i>CO₂ recovery</i>	Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
<i>Transport</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Non-renewable biomass</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Biofuel</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Pipeline leakage reduction</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>SF₆</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009

Høvik, 9 January 2009

Michael Lehmann

Michael Lehmann

Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Raman Venkata Kakaraparthi

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes				
Technical Area	CDM Validator	CDM Verifier	Sector Expert	Methodology Expert	Technical Reviewer
<i>Landfill gas</i>	Jan 2009				
<i>Hydro power</i>	Jan 2009				
<i>Renewables</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Wind power</i>					
<i>Other renewable</i>					
<i>Biomass</i>	Jan 2009				
<i>Grid connection of isolated system</i>					
<i>Cement</i>					
<i>Waste-heat / waste-gas recovery</i>	Jan 2009	Jan 2009	Jan 2009		
<i>Efficiency of thermal power plants</i>			Jan 2009		
<i>Coal mine methane</i>					
<i>Fuel switch</i>			Jan 2009		
<i>Manure management</i>					
<i>Waste / wastewater treatment</i>	Jan 2009				
<i>Energy efficiency</i>	Jan 2009	Jan 2009	Jan 2009		
<i>N₂O</i>					
<i>HFCs</i>	Jan 2009	Jan 2009			
<i>Flare reduction</i>					
<i>PFCs</i>					
<i>Charcoal</i>					
<i>CO₂ recovery</i>			Jan 2009		
<i>Transport</i>					
<i>Non-renewable biomass</i>					
<i>Biofuel</i>					
<i>Pipeline leakage reduction</i>					
<i>SF₆</i>					

Høvik, 9 January 2009

Michael Lehmann

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Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Ramesh Ramachandran

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes				
Technical Area	CDM Validator	CDM Verifier	Sector Expert	Methodology Expert	Technical Reviewer
<i>Landfill gas</i>	Jan 2009	Jan 2009	Jan 2009		
<i>Hydro power</i>	Jan 2009	Jan 2009			
<i>Renewables</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Wind power</i>	Jan 2009	Jan 2009			
<i>Other renewable</i>	Jan 2009	Jan 2009			
<i>Biomass</i>	Jan 2009	Jan 2009			
<i>Grid connection of isolated system</i>	Jan 2009	Jan 2009			
<i>Cement</i>	Jan 2009	Jan 2009			
<i>Waste-heat / waste-gas recovery</i>	Jan 2009	Jan 2009			
<i>Efficiency of thermal power plants</i>	Jan 2009	Jan 2009			
<i>Coal mine methane</i>	Jan 2009	Jan 2009			
<i>Fuel switch</i>	Jan 2009	Jan 2009			
<i>Manure management</i>	Jan 2009	Jan 2009			
<i>Waste / wastewater treatment</i>	Jan 2009	Jan 2009	Jan 2009		
<i>Energy efficiency</i>	Jan 2009	Jan 2009			
<i>N₂O</i>	Jan 2009	Jan 2009			
<i>HFCs</i>	Jan 2009	Jan 2009			
<i>Flare reduction</i>	Jan 2009	Jan 2009			
<i>PFCs</i>	Jan 2009	Jan 2009			
<i>Charcoal</i>	Jan 2009	Jan 2009			
<i>CO₂ recovery</i>	Jan 2009	Jan 2009			
<i>Transport</i>	Jan 2009	Jan 2009			
<i>Non-renewable biomass</i>	Jan 2009	Jan 2009			
<i>Biofuel</i>	Jan 2009	Jan 2009			
<i>Pipeline leakage reduction</i>	Jan 2009	Jan 2009			
<i>SF₆</i>	Jan 2009	Jan 2009			

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